

What is claimed is:

1. A rectifier bridge assembly comprising:  
a rectifier bridge circuit adapted to connect to at least one alternating current source;  
5 at least two diode compartments operatively connected to said rectifier bridge circuit and a direct current output to convert alternating current into direct current;  
a heat sink formed with at least two apertures for receiving said at least two diode compartments in spaced apart relation and in substantial contact with said heat  
10 sink;  
wherein heat from said diode compartments is evenly dispersed to said heat sink.
2. The assembly of claim 1 wherein said diode compartments include a diode surrounded by heat conductive epoxy contacting substantially all surfaces of said  
15 heat sink within said apertures.
3. The assembly of claim 2 wherein said epoxy is electrically non-conductive.
4. The assembly of claim 1 wherein said diode compartments include a diode formed from a rectifier die electrically connected to first and second copper tabs wherein said first copper tab is electrically connected to a contact surface in said  
20 aperture and said second copper tab is electrically connected to said rectifier bridge circuit.
5. The assembly of claim 4 wherein said diode compartments include said diode surrounded heat conductive epoxy contacting substantially all surfaces of said heat sink within said apertures.
- 25 6. The assembly of claim 5 wherein said epoxy is electrically non-conductive.
7. The assembly of claim 4 wherein said contact surface of at least one of said apertures is connected to a negative lead of a direct current circuit.
8. The assembly of claim 4 wherein said contact surface of at least one of said apertures is connected to a positive lead of a direct current circuit.
- 30 9. The assembly of claim 7 wherein said contact surface of at least one of said apertures is connected to a positive lead of a direct current circuit.

10. The assembly of claim 4 wherein said electrical connection of said first copper tab to said contact surface is by soldering.
11. The assembly of claim 4 wherein said electrical connection of said second copper tab to said contact surface is by soldering or welding.
- 5 12. The assembly of claim 4 wherein said heat sink includes fins.
13. A rectifier bridge assembly for use with an automotive alternator, comprising:
- a base plate mounted to the alternator and providing a negative lead;
  - an overlying finned positive lead operative as a heat sink;
  - 10 means for connecting said base plate to said overlying positive lead in an electrically non-conductive relation;
  - a plurality of wells formed into said positive lead in which a first portion of said wells have a bottom formed in said positive lead and a second portion of said wells have a bottom formed in said negative lead;
  - 15 a plurality of diodes mounted in said wells and electrically connected to a contact surface of said wells;
  - a thermally conductive and electrically non-conductive epoxy surrounding said diodes and in thermal communication with all surfaces within said well;
  - a plurality of stator connection terminals which each receives alternating
  - 20 current (AC) from the alternator and connects to a circuit overlying the positive lead;
  - said circuit being organized such that each of said stator connection terminals connects in circuit to said base plate across one of said plurality of diodes and to said positive lead across one of said plurality of diodes.
14. The assembly of claim 13 wherein the plurality of diodes connect to said
- 25 bottom surface of said wells by soldering.
15. The assembly of claim 13 wherein the plurality of diodes connect to said circuit by soldering or welding.
16. A rectifier bridge assembly for use with an automotive alternator, comprising:
- 30 a first finned base plate mounted to said alternator and providing a negative lead;

- 13 -

a second finned base plate mounted to the alternator in spaced apart relation to said first base plate and providing a positive lead;

means for connecting said second base plate to said alternator in an electrically non-conductive relation;

5 a plurality of wells formed into said first and second base plates;

a plurality of diodes mounted in said wells and electrically connected to a contact surface of said wells;

a thermally conductive and electrically non-conductive epoxy surrounding the diodes and in thermal communication with all surfaces within the well;

10 a plurality of stator connection terminals which each receives alternating current (AC) from the alternator and connects to a circuit overlying the first and second base plates;

said circuit being organized such that each of said stator connection terminals connects in circuit to said first base plate across one of said plurality of diodes and to  
15 said second base plate across one of said plurality of diode.

17. The assembly of claim 16 wherein said diodes connect to said bottom surface of said wells by soldering.

18. The assembly of claim 16 wherein said diodes connect to said circuit by welding or soldering.

20 19. The assembly of claim 16 having a heat sink formed from at least one of said first and second base plates.

20. A diode compartment for use in a rectifier bridge assembly having individual apertures for receiving said diode compartment in a heat sink comprising the steps of:

25 providing a diode having a rectifier die electrically connected between a first and second copper tab;

electrically connecting said first copper tab directly to a surface of said rectifier bridge assembly within said aperture;

30 providing an electrical connection from said second copper tab to a rectifier bridge circuit; and

surrounding said diode with thermally conductive, electrically non-conductive epoxy.

- 14 -

21. The diode compartment of claim 20 wherein said electrically connecting step includes soldering the first copper tab to said surface.

22. The diode compartment of claim 20 wherein said surrounding step includes filling in said entire aperture with epoxy such that substantially all surfaces with the

5 aperture are in contact with said epoxy.